CLAIMS:

1. A method for forwarding information in a multi-hop network having multiple nodes, said method comprising the steps of:

- recciving, in at least one receiving node, a superposition of signals transmitted from multiple transmitting nodes;
- employing multi-user detection (MUD) to decode multiple data packets from the received superposition of signals;
- prioritizing among correctly decoded packets to select at least one data packet suitable for forwarding; and
- replying with a packet acknowledgement for each selected packet.

2. The method according to claim 1, wherein said prioritizing step comprises the step of selecting multiple data packets suitable for forwarding, and multiple packet acknowledgements are transmitted to a plurality of corresponding transmitting nodes.

3. The method according to claim 2, wherein said multiple packet acknowledgements are aggregated in a single acknowledgement message.

4. The method according to claim 1, further comprising the step of transmitting a forwarding order to said at least one receiving node in response to a packet acknowledgement.

5. The method according to claim 4, further comprising the step of executing, in response to a forwarding order, forwarding of a corresponding selected packet.

6. The method according to claim 5, further comprising the step of said at least one receiving node replying, in response to a forwarding order, with a corresponding forwarding order acknowledgement.

7. The method according to claim 1, further comprising the step of said at least one receiving node limiting the number of selected packets.

8. The method according to claim 1, wherein said packet prioritizing step is performed based on optimization of a predetermined objective function.

9. The method according to claim 8, wherein said predetermined objective function includes information cost progress.

10. The method according to claim 1, wherein said packet prioritizing step is performed based on at least one Quality of Service (QoS) requirement.

11. The method according to claim 1, wherein said forwarding is performed based on a contention-based multiple access protocol.

12. The method according to claim 11, wherein said contention-based multiple access protocol is diversity oriented.

13. The method according to claim 12, wherein said diversity-oriented protocol is the selection diversity forwarding (SDF) protocol.

14. The method according to claim 11, wherein said contention-based multiple access protocol is an opportunistic protocol.

15. The method according to claim 1, wherein at least one transmitting node transmits its data packet signal to multiple relay candidate nodes, and said method further comprises the steps of:

- prioritizing among relay candidate nodes from which acknowledgements are received to select at least one suitable relay node;
- transmitting a forwarding order to said at least one selected relay node.

16. The method according to claim 15, wherein said step of prioritizing among relay candidate nodes is performed based on optimization of a predetermined objective function.

17. The method according to claim 15, wherein at least one of said multiple relay candidate nodes is implicitly addressed based on an indication that it is a neighbor of an explicitly addressed relay candidate node.

18. The method according to claim 1, further comprising the step of each transmitting node removing, in response to an acknowledgement of a previously transmitted packet, the acknowledged packet data from a data buffer in the transmitting node.

19. The method according to claim 1, wherein said multi-hop network is a broadcast/multicast packet radio network.

20. A system for forwarding information in a multi-hop network having multiple nodes, said system comprising:

- means for receiving, in at least one receiving node, a superposition of signals transmitted from multiple transmitting nodes;
- means for employing multi-user detection (MUD) to decode multiple data packets from the received superposition of signals;
- means for prioritizing among correctly decoded packets to select at least one data packet suitable for forwarding; and
- means for replying with a packet acknowledgement for each selected packet.

21. The system according to claim 20, wherein said packet prioritizing means is operable for selecting multiple data packets suitable for forwarding, and said replying

means is operable for transmitting multiple packet acknowledgements to a plurality of corresponding transmitting nodes.

22. The system according to claim 21, wherein said replying means is operable for aggregating multiple packet acknowledgements in a single acknowledgement message.

23. The system according to claim 20, further comprising means for transmitting a forwarding order to said at least one receiving node in response to a packet acknowledgement.

24. The system according to claim 23, further comprising means for executing, in response to a forwarding order, forwarding of a corresponding selected packet.

25. The system according to claim 23, further comprising means for replying, in response to a forwarding order, with a corresponding forwarding order acknowledgement.

26. The system according to claim 20, further comprising means for limiting the number of selected packets.

27. The system according to claim 20, wherein said packet prioritizing means is configured to perform packet prioritization based on optimization of a predetermined objective function.

28. The system according to claim 27, wherein said predetermined objective function includes information cost progress.

29. The system according to claim 20, wherein said packet prioritizing means is configured to perform packet prioritization based on at least one Quality of Service (QoS) requirement.

30. The system according to claim 20, wherein at least one transmitting node transmits its data packet signal to multiple relay candidate nodes, and said at least one transmitting node comprises:

- means for prioritizing among relay candidate nodes from which acknowledgements are received to select at least one suitable relay node;
- means for transmitting a forwarding order to said at least one selected relay node.

31. The system according to claim 30, wherein said means for prioritizing among relay candidate nodes is configured to perform candidate node prioritization based on optimization of a predetermined objective function.

32. The system according to claim 30, wherein said at least one transmitting node further comprises means for implicitly addressing at least one of said multiple relay candidate nodes based on an indication that it is a neighbor of an explicitly addressed relay candidate node.

33. The system according to claim 20, wherein said multi-hop network is a broadcast/multicast packet radio network.

34. A communication node in a packet radio multi-hop network, said communication node comprising:

- means for receiving a superposition of signals transmitted from multiple transmitting nodes;
- means for employing multi-user detection (MUD) to decode multiple data packets from the received superposition of signals;
- means for prioritizing among correctly decoded packets to select at least one data packet suitable for forwarding; and
- means for replying with a packet acknowledgement for each selected packet.

35. The communication node according to claim 34, wherein said packet prioritizing means is operable for selecting multiple data packets suitable for forwarding, and said replying means is operable for transmitting multiple packet acknowledgements to a plurality of corresponding transmitting nodes.

36. The communication node according to claim 35, wherein said replying means is operable for aggregating multiple packet acknowledgements in a single acknowledgement message.

37. The communication node according to claim 34, further comprising means for limiting the number of selected packets.

38. The communication node according to claim 34, wherein said packet prioritizing means is configured to perform packet prioritization based on optimization of a predetermined objective function.

39. The communication node according to claim 38, wherein said predetermined objective function includes information cost progress.

40. The communication node according to claim 34, wherein said packet prioritizing means is configured to perform packet prioritization based on at least one Quality of Service (QoS) requirement.

41. A communication node in a packet radio multi-hop network, said communication node comprising:

- means for transmitting a data packet signal to multiple relay candidate nodes, at least one of said multiple relay candidate nodes being implicitly addressed based on an indication that it is a neighbor of an explicitly addressed relay candidate node;

- means for prioritizing among relay candidate nodes from which acknowledgements that a packet has been accepted for forwarding are received to select at least one suitable relay node; and

- means for transmitting a forwarding order to said at least one selected relay node.
